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(54) Title of Invention: Tension Equalizing Driving Device

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(57) Claim

The claim relates to a tension equalizing driving device which transmits the rotation of a drive pulley to a driven pulley with the use of a power transmission component which links the driven pulley and the drive pulley connected to the drive shaft of a 4-cylinder internal combustion engine of which rotation periodically fluctuates. The claim to be made is a tension equalizing driving device which is characterized by such a design that the outline of the drive pulley is made to be oval in shape with a ratio of the major axis to the minor axis determined by the fluctuation of the tension of the power transmission component due to the periodic fluctuation of the rotation mentioned above, and that the drive pulley is installed in such a way that it gives the power transmission component a tension fluctuation with the phase opposite to that of the tension fluctuation of the power transmission component.

Brief explanation of the illustrations

Fig.1A shows an outline of an example of the tension equalizing driving device described in this claim. Fig.1B shows how the tension equalizing driving device can be used as a timing belt driving device of an internal combustion engine. Fig.2 shows characteristic curves demonstrating

a relationship between the tension caused by a driving torque of the valve train against the crank angle and the tension produced by the tension equalizing driving device shown in Fig.1A. Fig.3 is an outline of a conventional timing belt driving device of an internal combustion engine. Fig.4 shows characteristic curves indicating the fluctuation of torque and that of tension of the valve train. Fig.5 is a graph which shows a relationship between the belt tension and the engine speed.

1 - tension equalizing driving device, 2 - toothed pulley of the drive shaft of the camshaft, 3 - toothed timing belt, 4 - auto tensioner, 9 - toothed pulley of the drive shaft of the oil pump, 10 - idler.

Fig. 2

Tension [vertical axis]

Crank angle [horizontal axis]

Fig. 3

Fig. 1

Fig. 4

Tension, Torque [vertical axis]

Time [horizontal axis]

One engine rotation

Fig. 5

Belt tension (kg) [vertical axis]

Engine speed [horizontal axis]

⑲日本国特許庁(JP) ⑪実用新案出願公開

⑫公開実用新案公報(U) 平1-95538

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審査請求 未請求 (全2頁)

⑭考案の名称 等張力化駆動装置

⑪実願 昭62-192077
⑫出願 昭62(1987)12月18日

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⑤実用新案登録請求の範囲

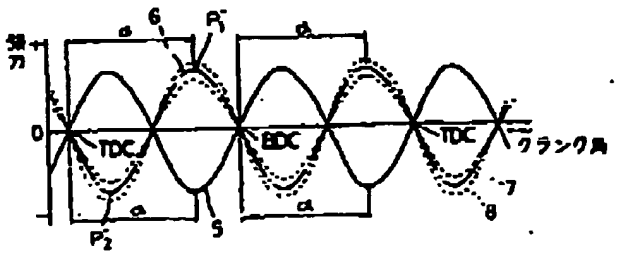
周期的に回転変動が生じる4気筒内燃エンジンの出力軸に結合された駆動車と被駆動車間に掛回された動力伝達部材により前記駆動車の回転を前記被駆動車に伝達する等張力化駆動装置において、前記駆動車の外周部形状を前記周期的回転変動による前記動力伝達部材の張力変動に応じた長径/短径比を有する楕円形状に成形し、前記張力変動と逆位相の張力変動を前記動力伝達部材に与えるように前記駆動車を配設することを特徴とする等張力化駆動装置。

図面の簡単な説明

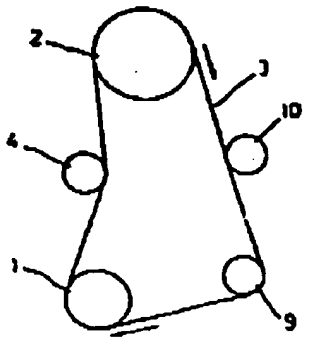
第1図は本考案の等張力化駆動装置の一実施例を示す概略外形図、第1図Bは第1図Aの等張力化駆動装置を内燃エンジンのタイミングベルト駆動装置に適用した概略構成図、第2図はクランク角に対する動弁系駆動トルクによる張力と第1図Aの等張力化駆動装置による張力との関係を示す特性図、第3図は従来の内燃エンジンのタイミングベルト駆動装置の概略構成図、第4図は動弁系のトルク変動及び張力変動を示す特性図、第5図はベルト張力とエンジン回転数との関係を示すグラフである。

1…等張力化駆動装置、2…カムシャフトの駆動軸の歯付プーリー、3…歯付タイミングベルト、4…オートテンショナ、9…オイルポンプの駆動軸の歯付プーリー、10…アイドラ。

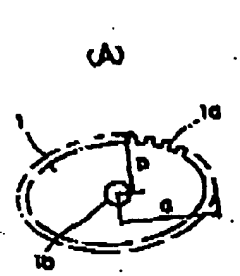
第2図



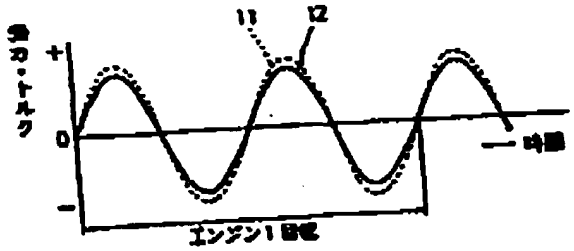
第3図



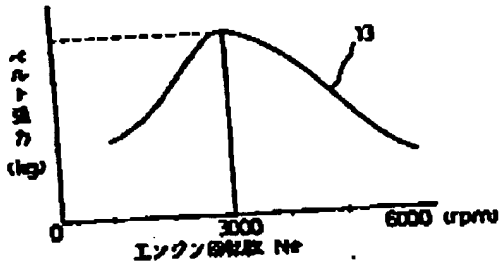
第1図


(A)
1
10
P
a
10
(B)
2
TDC
O1
4
3'
3
TDC
8
O1
1
P2
P1

第4図


11
12
+
0
−
時間
エンジン1回転

第5図


13
(kg)
0
3000
6000 rpm
エンジン回転数 Ne

German Patent No. 195 20 508 A1
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